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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,488	05/30/2001	Young Joo Yee	2080-3-20	8736

35884 7590 07/13/2005

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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,488

Applicant(s)

YEE, YOUNG JOO

Examiner

Peter Vincent Agustin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-16 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 13-16 & 18-21 are now pending.

Claim Objections

2. Claim 21 is objected to because of the following informalities:

Claim 21, line 2: "front edge" should be --front etch--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 13 & 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishizaki et al. (US 6,044,041).

In regard to claim 13, Ishizaki et al. disclose an optical pickup head (Figure 4) which makes a fine movement by a driver, and focuses an incident laser beam (output of 57) to a recording medium (51) for recording/reproducing a data, the optical pickup head comprising: a single micro mirror (69) having at least one approximately 45° mirror surface (note that a 45° mirror surface is necessary to reflect a beam from element 70 to the medium 51 in a perpendicular direction) for reflecting the incident laser beam perpendicular to an incident direction; a focusing lens (71) under the micro mirror for primary focusing of the laser beam reflected at the micro mirror; an SIL (Solid Immersion Lens) (72) under the focusing lens for secondary focusing of the laser beam focused by the focusing lens; a supporting frame (Figure 4:

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SWING ARM; see also Figure 3, element 56; and column 6, lines 54-56) for integrating the micro mirror, the focusing lens and the SIL (Solid Immersion Lens) such that the micro mirror, focusing lens and SIL are held stationary with respect to each other (column 6, lines 53-56) and movement of the supporting frame is controllable by a single driver (not shown, inherent mechanism that drives the SWING ARM of Figure 4); and an air-bearing surface (space between elements 51 & 72) formed under the supporting frame for making the supporting frame buoyant (suggested by "head floating slider" on column 8, line 33; and "floating-type" on column 8, line 43).

In regard to claim 18, Ishizaki et al. disclose that the 45° mirror surface of the micro-mirror, a focus plane of the focusing lens, and a focus plane of the SIL are aligned in parallel (as shown by Figure 4, elements 69, 71 & 72).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. in view of Jerman et al. (US 6,061,323).

For a description of Ishizaki et al., see the rejection above. However, Ishizaki et al. are silent: in regard to claim 14, the 45° mirror surface of the micro mirror has a highly reflective metal coating applied thereto; and in regard to claim 15, the micro mirror is formed of a silicon substrate.

German et al. disclose a mirror surface having a highly reflective metal coating applied thereto, and formed of a silicon substrate (column 16, lines 53-56). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided the highly reflective metal coating of German et al. to the mirror surface of Ishizaki et al., the motivation being to provide a micro-mirror with an improved stiffness/mass ratio for lower mirror distortion, and improved combinations of maximum mirror angular displacement, operating voltage range, mirror stiffness, mirror flatness and resonant frequency (column 3, lines 46-56). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have formed the micro mirror of Ishizaki et al. with a silicon substrate as suggested by German et al., the motivation being to provide a mechanically-rigid micro mirror (a well-known advantage of silicon, see Wilde et al. (US 6,044,056), column 8, lines 16-17).

7. Claims 16 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. & German et al. as applied to claim 15 above, and further in view of Ohashi et al. (US 6,487,224).

For a description of Ishizaki et al. & German et al., see the rejection above. However, Ishizaki et al. & German et al. do not explicitly disclose: in regard to claim 16, that the silicon substrate is a 9.74° off-axis silicon wafer; and in regard to claim 21, that the size of the micro mirror is determined by a pattern size of a front edge mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication process.

Ohashi et al. disclose a 9.74° off-axis silicon wafer substrate (column 1, lines 34-56) wherein the size of a micro mirror is determined by a pattern size of a front edge mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication

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process (understood from the discussion on column 1, lines 42-60). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have used the 9.74° off-axis silicon wafer of Ohashi et al. for the silicon substrate of Ishizaki et al. & Jerman et al., the motivation being to reduce the number of parts.

8. Claims 19 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. in view of Mandella (US 6,181,478).

For a description of Ishizaki et al., see the rejection above. Furthermore, in regard to claim 19, Ishizaki et al. inherently disclose that the supporting frame has at least one opening (not shown, hole where element 72 is fitted). However, in regard to claim 19, Ishizaki et al. do not explicitly disclose that the opening comprises a side surface sloped at a fixed angle such that an upper width thereof is greater than a lower width thereof.

Mandella, in the optical recording art (see last three lines of abstract), discloses an opening (see Figure 3B) comprising a side surface (62) sloped at a fixed angle such that an upper width thereof is greater than a lower width thereof. It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided the sloped opening of Mandella to the supporting frame of Ishizaki et al., the motivation being to provide an optical system having a small size, and to eliminate misalignment problems (column 2, lines 57-65).

In regard to claim 20, Ishizaki et al. disclose that the SIL (Figure 4, element 72) is fitted in the at least one opening of the supporting frame.

Response to Arguments

9. Applicant's arguments filed May 27, 2005 have been fully considered but they are not persuasive.

a. The Applicant argues on page 6, paragraphs 2-4 that "the invention of independent claim 13 is patentably structurally different from the invention disclosed by Ishizaki and claim 13 is allowable over the cited reference". The Examiner disagrees. Ishizaki et al. disclose all the limitations of claim 13 as amended.

While the Applicant notes that "Ishizaki discloses two mirrors", it should be noted that the preamble of claim 13 recites the term "comprising" and does not preclude using a reference having more than one mirror. Therefore, the Ishizaki et al. reference does disclose at least a single micro mirror (Figure 4, element 69).

Column 6, lines 53-56 of Ishizaki et al. recite that "a mirror 69, an object lens 71 and a solid immersion lens 72 of the movable optical system P2 are provided on the swing arm 56", i.e., the claimed "the micro mirror, focusing lens and SIL are held stationary with respect to each other". Furthermore, the claimed "supporting frame" corresponds to the SWING ARM in Figure 4, which is understood to be driven by a mechanism (not shown), i.e., the claimed "movement of the supporting frame is controllable by a single driver".

Furthermore, the Applicant notes that Ishizaki discloses two mirrors, neither of which is disclosed as a "micro mirror". It is the Examiner's position that the term "micro" is a relative term, which is interpreted as any mirror tiny enough to be used in an optical recording/reproducing system. Furthermore, the Applicant's disclosure does not

specifically point out what a micro mirror is in such a way to distinguish it from the mirror of the prior art, e.g., the mirror of Ishizaki et al. Therefore, consistent with the Applicant's disclosure, the Examiner maintains that Figure 4, element 69 of Ishizaki et al. is a micro mirror.

b. Applicant's arguments regarding the rejection of claims 14-16 & 18-20 (see page 6, last two three paragraphs and page 7, first five paragraphs) fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is 571-272-7567.

The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter Vincent Agustin
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BRIAN E. MILLER
PRIMARY EXAMINER